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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/733,752
Filing Date: December 11, 2003
Appellant(s): BARSNESS ET AL.

Derek P. Martin
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed October 18, 2007 appealing from the Office action mailed May 18, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,680,614	Bakuya et al.	10-1997
2003/0084025	Zuzarte	5-2003
6,463,429	Geppert et al.	10-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-6, 8, 9, 11-13, 15-24, 29, 32-36, 38, 41, 43 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bakuya et al. (US Patent 5,680,614) hereinafter "Bakuya", in view of Zuzarte (US Patent Pub 2003/0084025).

In regards to **claim 1**, Bakuya discloses an apparatus comprising:

a. at least one processor (Bakuya: Fig. 1; col. 5, lines 14-27)[1];

b. a memory coupled to the at least one processor (Bakuya: Fig. 1; col. 5, lines 14-27);

c. a database residing in the memory (Bakuya: Fig. 1; col. 5, lines 14-27);

d. a range constraint defined for the database, the range constraint including at least one limit (Bakuya: Fig. 6); and

e. a database manager residing in the memory and executed by the at least one processor, wherein the range constraint defines a range that includes the at least one limit, and wherein the database manager allows entry of data into the database when the data lies within the range (Bakuya: Fig. 1, element 12 (database manager); fig. 6 (range constraint with at least one limit); Col. 9, lines 32-40).

Bakuya does not expressly disclose at least one limit that is dynamically determined from data in the database.

[1] It is clear from this description that the database system resides on a computer, which includes a processor and a type of memory, the database residing on the memory.

Zuzarte discloses selecting a column or generating a virtual column and performing a statistical analysis on the particular column regarding information such as high and low values. From the statistical information, Zuzarte discloses creating constraints that reflect the statistical characteristic of the particular column (Zuzarte: para. 0020, lines 6-12).

Bakuya and Zuzarte are analogous art because they are directed to the same field of endeavor of database management.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the apparatus of Bakuya by adding the feature of at least one limit that is dynamically determined from data in the database, as taught by Zuzarte.

The motivation for doing so would have been because constraining the values of a column to a particular range allows for database queries to be optimized (Zuzarte: para. 0003).

In regards to **claim 2**, Bakuya and Zuzarte disclose the apparatus of claim 1 wherein the database comprises at least one database table comprising at least one column, and wherein the range constraint is defined for a selected column (Bakuya: Fig. 6 (constraint defined for column "EMPLOYEE_NUMBER")).

In regards to **claim 4**, Bakuya discloses the apparatus of claim 2 wherein the at least one limit is dynamically determined from data in a column that is different than the selected column (Zuzarte: para. 0020, lines 2-4, 6-12)[2].

[2] If a virtual column is chosen for the statistical analysis, the virtual column is created from multiple of the actual columns. Thus, the statistical analysis to derive the statistical constraints are derived from data from columns different from the selected column.

In regards to **claims 3 and 5**, Bakuya and Zuzarte disclose the apparatus of claim 2 wherein the at least one limit is dynamically determined from data in the selected column, wherein the at least one limit is dynamically determined by performing statistical analysis on data in the database (Zuzarte: para. 0020, lines 6-12).

In regards to **claim 6**, Bakuya and Zuzarte disclose the apparatus of claim 1 wherein the range constraint defines a range that includes the at least one limit, and wherein the database manager allows entry of data into the database when the data lies within the defined range and does not allow entry of data into the database when the data lies outside the defined range (Bakuya: col. 9, lines 36-40).

Claim 8 is substantially similar to the combination of claims 1 and 2 and is rejected for the same reasons.

Claim 9 is substantially similar to claim 6 and is rejected for the same reasons.

In regards to **claim 11**, Bakuya and Zuzarte discloses the apparatus of claim 8 wherein the at least one limit is dynamically determined by performing statistical analysis on data in the selected column (Zuzarte: para. 0020, lines 6-12).

Claim 12 is substantially similar to the combination of claims 1, 2 and 4 and is rejected for the same reasons.

Claim 13 is substantially similar to claim 6 and is rejected for the same reasons.

Claim 15 is substantially similar to a combination of claims 4 and 5 and is rejected for the same reasons.

Claims 16-20 are substantially similar to claims 1-5 in the form of a method and are rejected for the same reasons.

Claim 21 is substantially similar to the combination of claims 1 and 2 in the form of a method and is rejected for the same reasons.

Claims 22-24 are substantially similar to claims 3, 4 and 5 respectively, in the form of a method and are rejected for the same reasons.

Claim 29 is substantially similar to claim 1 in the form of a computer readable program product and is rejected for the same reasons. In regards to the computer readable recordable media, Bakuya and Zuzarte disclose a computer, which includes storage devices (Bakuya: col. 5, lines 14-27).

Claims 32-36 are substantially similar to claims 2-6 respectively in the form of a computer readable program product and are rejected for the same reasons.

Claims 38 and 41 are substantially similar to claims 8 and 9 respectively in the form of a computer readable program product and are rejected for the same reasons. In regards to the computer readable recordable media recited in claim 38, Bakuya and Zuzarte disclose a computer which includes a storage device (Bakuya: col. 5, lines 14-27).

Claim 43 is substantially similar to claim 12 in the form of a computer readable program product and is rejected for the same reasons. In regards to the computer readable recordable media, Bakuya and Zuzarte disclose a computer, which includes a storage device (Bakuya: col. 5, lines 14-27).

Claim 46 is substantially similar to claim 13 in the form of a computer readable program product and is rejected for the same reasons.

Claims 7, 10, 14, 25-28, 37, 42 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bakuya et al. (US Patent 5,680,614) hereinafter "Bakuya", in view of Zuzarte (US Patent Pub 2003/0084025), further in view of Geppert et al. (US Patent 6,463,429) of record, hereinafter "Geppert".

In regards to **claim 7**, Bakuya and Zuzarte disclose a database manager residing in the memory and executed by the at least one processor, wherein the range constraint defines a range that includes the at least one limit (Bakuya: Fig. 1, element 12 (database manager); fig. 6 (range constraint with at least one limit); Col. 9, lines 32-40), and wherein:

a. if the data lies within the defined range, the database manager allows entry of the data into the database (Bakuya: Col. 9, lines 36-37); and

b. if the data lies outside the defined range, the database manager allows provides a warning message (Bakuya: col. 9, lines 39-40).

Bakuya and Zuzarte do not expressly disclose if the data lies out side of the defined range, the database manager allows entry of the data into the database in addition to providing a warning message.

Geppert discloses a system and method for consistency constraint management (Geppert: Col. 4, lines 47-61). Geppert further discloses a corrective action when data is outside the range constraint wherein a corrective action is set to be an alert sent to a responsible party (warning), even though the query result is returned to the user (allows entry of the data into the database) (Geppert: col. 5, lines 15-20).

Bakuya, Zuzarte and Geppert are analogous art because they are from the same field of endeavor of database range constraints.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify the combined apparatus of Bakuya and Zuzarte by modifying the database manager to have the feature of allowing entry of the data into the database, even if the data lies out side of the defined range and providing a warning message, as taught by Geppert.

The motivation for doing so would have been because there are times when a data lies outside the range, however, the data may still be valid. In those cases, it would be better to notify an administrator to determine whether the data is incorrect or whether the data is correct even though it is outside the range constraint instead of restricting the data completely (Geppert: col. 2, lines 42-54).

Claim 10 is substantially similar to claim 7 and is rejected for the same reasons.

Claim 14 is substantially similar to claim 7 and is rejected for the same reasons.

In regards to **claim 25**, Bakuya discloses the computer-implemented method for entering data into a selected column in a database table, the method comprising the steps of:

a. defining a range constraint for the selected column, the range constraint defining a range that includes at least one limit (Bakuya: Fig. 1, element 12 (database manager); fig. 6 (range constraint with at least one limit); Col. 9, lines 32-40); and

b. if the data to be entered lies outside of the defined range, providing a warning message (Bakuya: col. 9, lines 39-40).

Bakuya does not expressly disclose the limit being dynamically determined from data in the database table and if the data to be entered lies outside of the defined range, allowing entry of data into the selected column, and in response thereto, providing a warning message.

Zuzarte discloses selecting a column or generating a virtual column and performing a statistical analysis on the particular column regarding information such as high and low values. From the statistical information, Zuzarte discloses creating constraints that reflect the statistical characteristic of the particular column (Zuzarte: para. 0020, lines 6-12).

Geppert discloses a system and method for consistency constraint management (Geppert: Col. 4, lines 47-61). Geppert further discloses a corrective action when data is outside the range constraint wherein a corrective action is set to be an alert sent to a responsible party (warning), even though the query result is returned to the user (allows entry of the data into the database) (Geppert: col. 5, lines 15-20).

Bakuya, Zuzarte and Geppert are analogous art because they are from the same field of endeavor of database range constraints.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the method of Bakuya by making the limit being dynamically determined from data in the database table, as taught by Zuzarte, and adding the condition of if the data to be entered lies outside of the defined range, allowing entry of data into the selected column, and in response thereto, providing a warning message, as taught by Geppert.

The motivation for doing so would have been because constraining the values of a column to a particular range allows for database queries to be optimized (Zuzarte: para. 0003). Also, there are times when data lies outside the range, however, the data may still be valid. In

those cases, it would be better to notify an administrator to determine whether the data is incorrect or whether the data is correct even though it is outside the range constraint instead of restricting the data completely (Geppert: col. 2, lines 42-54).

In regards to **claim 26**, Bakuya, Zuzarte and Geppert disclose wherein step (A) defines at least one limit that is dynamically determined from data in the selected column (Zuzarte: para. 0020, lines 6-12).

In regards to **claim 27**, Bakuya, Zuzarte and Geppert disclose wherein step (A) defines at least one limit that is dynamically determine from data in a column that is different than the selected column (Zuzarte: para. 0020, lines 6-12)[3].

In regards to **claim 28**, Bakuya, Zuzarte and Geppert disclose wherein step (A) defines at least one limit that is dynamically determined by performing statistical analysis on data in the database table (Zuzarte: para. 0020, lines 6-12).

Claim 37 is substantially similar to claim 7 in the form of a computer readable program product and is rejected for the same reasons.

Claim 42 is substantially similar to claim 7 in the form of a computer readable program product and is rejected for the same reasons.

Claim 47 is substantially similar to claim 7 in the form of a computer readable program product and is rejected for the same reasons.

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[3] If a virtual column is chosen for the statistical analysis, the virtual column is created from multiple of the actual columns. Thus, the statistical analysis to derive the statistical constraints are derived from data from columns different from the selected column.

(10) Response to Argument

A. The rejection of claims 1, 2, 8, 16, 17, 29, 32 and 38 under 35 U.S.C. 103(a) is proper.

A proper rejection under 35 U.S.C. 103(a) requires that a prima facie case of obvious be established. In order to do so, the Examiner must show that (1) the prior art discloses all the limitations of the claims, (2) there is a reasonable expectation of success and (3) there is a motivation to combine found in the prior art or in knowledge commonly available to one of ordinary skill in the art. The discussion below will show that all three criteria are fully satisfied.

In regards to claim 1, Appellant alleges that the combination of Bakuya and Zuzarte fail to disclose all the limitations. In particular, Appellant alleges that the combination of Bakuya and Zuzarte do not disclose "at least one limit that is dynamically determined from data in the database" (Brief at 7.) In support of this allegation, Appellant argues that (1) the statistical soft constraints in Zuzarte cannot be used as integrity constraints and (2) that the motivation provided by the Examiner is improper. These arguments are addressed below in turn.

A.1 The statistical analysis of Zuzarte in combination with Bakuya can be used to create limits in range constraints.

Appellant alleges that the statistical soft constraints disclosed by Zuzarte cannot be used as integrity constraints because they "have nothing to do with range constraints or other integrity constraints" (Brief at 8.) One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir.

1986). Bakuya discloses range constraints that include at least one limit. Bakuya at fig. 6. It is conceded that Bakuya does not expressly disclose that at least one limit is dynamically determined from the data in the database. Zuzarte discloses performing a statistical analysis on a particular column regarding information such as high and low values and creating constraints from the statistical information. Zuzarte at para. 0020, lines 6-12. Bakuya's range constraint, modified by Zuzarte's feature of performing a statistical analysis on a particular column of data, would result in a range constraint with one limit dynamically determined from the data.

Appellant argues that the statistical constraints of Zuzarte cannot be used as integrity constraints, however, whether the statistical constraints of Zuzarte can be used as integrity constraints is irrelevant. The statistical analysis disclosed by Zuzarte can be utilized to determine constraints, especially since the statistical analysis considers the high and low values of data in a column of a table in a database. While Zuzarte does not use the statistical information to create integrity constraints, one of ordinary skill in the art would be motivated to combine this feature with the range constraints of Bakuya.

Appellant further argues that one of ordinary skill in the art would not be motivated to combine Bakuya with Zuzarte because "statistical constraints ... have nothing to do with range constraints" (Brief at 10.) The Examiner respectfully disagrees. Since both Bakuya and Zuzarte disclose database constraints, one of ordinary skill in the art would have been motivated to at least try determining limits of range constraints using statistical analysis. KSR International Co. v. Teleflex Inc. 550 U.S. ___, 82 USPQ2d 1385 (2007).

Thus, for the reasons above, the statistical analysis disclosed by Zuzarte in combination with Bakuya can be used to create limits in range constraints.

A.2 There is a proper motivation to combine Bakuya with Zuzarte, which is found in Zuzarte and in knowledge commonly available to one of ordinary skill in the art.

Appellant alleges that the motivation to combine Bakuya with Zuzarte is defective (Brief at 11) reasoning that Zuzarte nowhere discloses constraining values of a column to a particular range (Brief at 11.) The Examiner respectfully disagrees. In cited paragraph 0003, Zuzarte describes the difficulty in performing complex queries and estimating cardinalities without having some knowledge about the relationship between columns. Zuzarte continues by describing a statistical analysis of the columns would be advantageous in aiding the cardinality estimate, which in turn would be used for optimizing queries to the database table. *See Also* Zuzarte at para. 0006. As discussed above, Zuzarte goes on to disclose statistical constraints on database table columns. It follows, that Zuzarte discloses creating database constraints from a statistical analysis of columns in a table, in order to more easily estimate cardinality, which is used for optimizing queries.

Appellant further alleges that the Examiner attempted to shift rationale. On the contrary, the Examiner attempted to explain the rationale behind the motivation. In the advisory action, the Examiner states that "[p]aragraph 0003 of Zuzarte cited for the motivation to combine discusses the advantages of determining statistics of values of a column as it would aid in estimating cardinality, thereby aiding in optimization of queries." Advisory Action at 2. Thus, the motivation to combine Bakuya with Zuzarte did not change, contrary to Appellants allegation.

Finally, Appellant generally alleges that there is no motivation to combine Bakuya with Zuzarte. The Examiner respectfully disagrees. The Examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, as discussed above in section A.1, both Bakuya and Zuzarte disclose database constraints. Therefore, one of ordinary skill in the art would be motivated to at least try to combine Bakuya with Zuzarte to create a database with range constraints that also makes optimizing queries easier. In addition, paragraph 0003 of Zuzarte describes the advantages of determining statistical information, in that it aids in estimating cardinality, which is used for optimizing queries. Thus, there is a motivation to combine found in Zuzarte and in knowledge commonly available to one of ordinary skill in the art.

A. Conclusion

The claims were rejected under 35 U.S.C. 103(a) as being obvious over Bakuya in view of Zuzarte. As noted above, three criteria must be satisfied in order to establish a prima facie case of obviousness. Here, Bakuya and Zuzarte in combination disclose all the limitations of claim 1. There is a reasonable expectation of success in combining Bakuya with Zuzarte because they both are directed to database constraints. Lastly, there is a motivation to combine found in Zuzarte and in knowledge commonly available to one of ordinary skill in the art. Therefore, all three criteria for establishing a prima facie case of obviousness are fully satisfied. As a result,

the rejection of claim 1 under 35 U.S.C. 103(a) is proper and should be sustained. The rejection of claims 2, 8, 16, 17, 29, 32 and 38 under 35 U.S.C. 103(a) is proper for the same reasons. It is respectfully requested that the rejection of claims 1, 2, 8, 16, 17, 29, 32 and 38 under 35 U.S.C. 103(a) be sustained.

B. The rejection of claims 3, 18 and 33 under 35 U.S.C. 103(a) is proper.

Appellant's arguments with regards to the rejection of claims 3, 18 and 33 are similar to those presented with respect to the independent claims addressed above. In particular, Appellant argues that the statistical constraints of Zuzarte cannot be used as integrity constraints (Brief at 15.) As discussed above, statistical constraints can be used as integrity constraints. Therefore, the rejection of claims 3, 18 and 33 under 35 U.S.C. 103(a) is proper for the reasons set forth above in section A. It is respectfully requested that the Board sustain the rejection of claims 3, 18 and 33 under 35 U.S.C. 103(a).

C. The rejection of claims 4, 12, 19, 34 and 43 under 35 U.S.C. 103(a) is proper.

Appellant's arguments with regards to the rejection of claims 4, 12, 19, 34 and 43 are similar to those presented with respect to the independent claims addressed above. In particular, Appellant argues that the statistical constraints of Zuzarte cannot be used as integrity constraints (Brief at 16.) As discussed above, statistical constraints can be used as integrity constraints. Therefore, the rejection of claims 4, 12, 19, 34 and 43 under 35 U.S.C. 103(a) is proper for the reasons set forth above in section A. It is respectfully requested that the Board sustain the rejection of claims 4, 12, 19, 34 and 43 under 35 U.S.C. 103(a).

D. The rejection of claims 5, 11, 15, 20 and 35 under 35 U.S.C. 103(a) is proper.

Appellant's arguments with regards to the rejection of claims 5, 11, 15, 20 and 35 are similar to those presented with respect to the independent claims addressed above. In particular, Appellant argues that the statistical constraints of Zuzarte cannot be used as integrity constraints (Brief at 17.) As discussed above, statistical constraints can be used as integrity constraints. Therefore, the rejection of claims 5, 11, 15, 20 and 35 under 35 U.S.C. 103(a) is proper for the reasons set forth above in section A. It is respectfully requested that the Board sustain the rejection of claims 5, 11, 15, 20 and 35 under 35 U.S.C. 103(a).

E. The rejection of claims 6, 9, 13, 36 and 41 under 35 U.S.C. 103(a) is proper.

Appellant's arguments with regards to the rejection of claims 6, 9, 13, 36 and 41 refer to the arguments presented with respect to independent claim 1, which are addressed in section A. Consequently, the Examiner respectfully requests that the Board sustain the rejection of claims 6, 9, 13, 36 and 46 under 35 U.S.C. 103(a) for the same reasons.

F. The rejection of claims 21-24 and 46 under 35 U.S.C. 103(a) is proper.

Appellant's arguments with regards to claims 21-24 and 46 reference the arguments presented with regards to claims 1, 3, 4, 5 and 6 respectively, which are addressed above. Therefore, the Examiner respectfully requests that the Board sustain the rejection of claims 21-24 and 46 for the same reasons.

G. The rejection of claims 7, 10, 14, 25-28, 37, 42 and 47 under 35 U.S.C. 103(a) is proper.

In regards to claim 7, Appellant alleges that Geppert fails to disclose a "database manager [that] allows entry of the data into the database and providing a warning message" (Brief at 21.) The Examiner respectfully disagrees. First, the Examiner notes that Appellant cites the incorrect portion of Geppert. Geppert discloses that when a constraint violation occurs, the inconsistency is stored "to correct the inconsistency" (i.e., allows entry of the data into the database). Geppert further discloses that there are several configurations, one of which is "alerting", where alerts are sent to a responsible party, for example the system manager (i.e., providing a warning message). Geppert at col. 5, lines 10-20. Thus, contrary to Appellant's contention, Geppert discloses a database manager that allows entry of the data into the database and providing a warning message, as recited in the claims.

In regards to claims 10, 14, 25-28, 37, 42 and 47, Appellant references the arguments presented in regards to claim 7, which are addressed above. Therefore, the rejection of claims 10, 14, 25-28, 37, 42 and 47 is proper for the same reasons. Since a prima facie case of obviousness is established, the rejection of claims 7, 10, 14, 25-28, 37, 42 and 47 under 35 U.S.C. 103(a) is proper. As a result, the Examiner respectfully requests that the Board sustain the rejection of claims 7, 10, 14, 25-28, 37, 42 and 47 under 35 U.S.C. 103(a) for the above reasons.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Michael Le

Examiner

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